Mr. Hansbury

Comparing Volume Measurements

Partners: Mrs. Jackson, Mrs. Shapiro, Mr. Sterman

The next section asks a brief question about what you hope to learn by performing the experiment. For example, "What is the relationship between the speed of a car and the distance the car needs to skid to a stop?"

Focus Question: **What is the relationship between cm^3 and mL?**

In the section below make an "IF… Then… Because" statement that explains what you expect your data to show. For example, "IF you study a lot, THEN you will do well on your tests BECAUSE studying improves test scores."

Hypothesis **If the number of measured volume in cm3 increases, then the volume measured in mL will also increase because they are both units for measuring the same thing.**

In this next section you give a general overview of HOW and WHY you did what you did during the experiment. This should be an explanation of how the lab techniques you performed gave you the data necessary to answer the purpose.

Experimental Design: **We measured the INSIDE diameter of a container (so that we could figure out the interior volume of the cylinder) and converted this to a radius. After pouring some water into the container, we measured the height of the water (not the container) to have enough data to calculate volume. The water was then poured into a graduated cylinder, and the volume of water in milliliters was measured using the scale. A comparison between mL and cm^3 was then made.**

Use the section below to record the facts you collect when you perform the lab. Numbers should be in table form, identified, and labeled with units.

Raw Data:

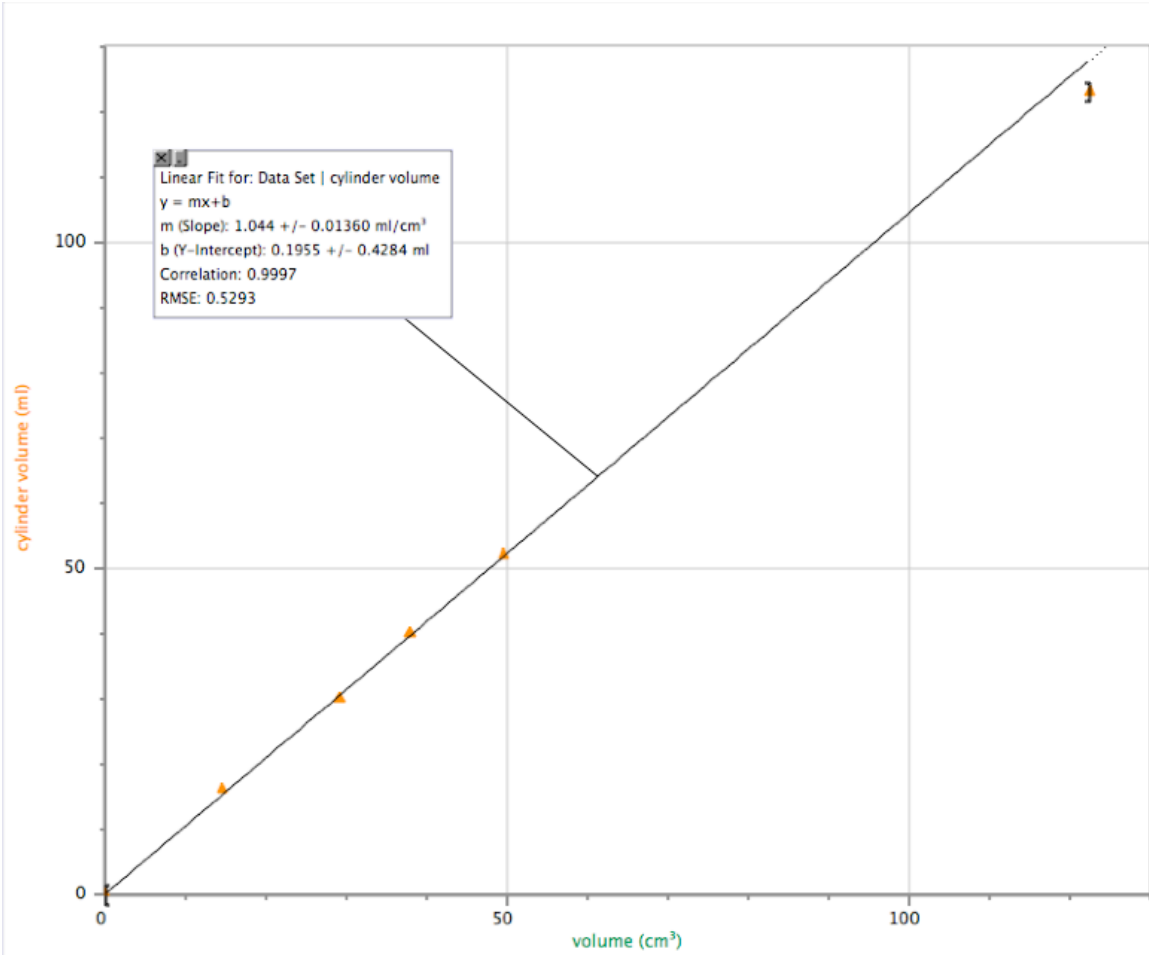
Data Set

height (cm)	width (cm)	length (cm)	volume (cm^3)	cylinder volume (ml)
4.2	5.4	5.4	1.2E+02	123
~~2.7~~	~~5.4~~	~~5.4~~		~~104~~
1.7	5.4	5.4	50	52
1.3	5.4	5.4	38	40
1.0	5.4	5.4	29	30
0.5	5.4	5.4	15	16
0.0	5.4	5.4	0	0

*This next section includes any manipulations of data (calculations, graphs, diagrams) required to reach a conclusion. All the math goes in this section. Show the **labeled** set-up of any calculation required in processing the data:*

To find radius: Diameter/2 = Radius 3.8 cm /2 = 1.9 cm
To find area of circle: πr^2 = Area 3.14 x (1.9 cm)^2 = 11.341 cm^2
To find volume of cylinder:
A x h = Vol 11.341 cm^2 x 1.2 cm = 13.609 cm^3

Graphing & math:



In the final section you interpret the results of your observations and calculations. State and explain what principle(s) your results illustrate.

Conclusion:

The graph gave me an equation of a straight line (y = mx + b) that was converted to show that

Calc. Vol. = (0.9279 cm^3/mL) x Meas. Vol + 4.86 cm^3

This means that 1 mL is the same as 0.927 cm^3 The class data showed that the real answer was 1 mL is the same a 1 cm^3
The y-intercept of 4.86 mL tells me that even if I had no water in the container I still would have calculated a volume of 4.86 cm^3 . In other words, I must have lost water during the transfer from one container to the other. Since 4.86 cm^3 is much less than 5% of 180 cm^3, I can safely assume that the y-intercept is theoretically zero.

At the end of some lab experiments you might be given a series of questions to answer in the conclusion. Write the answers to these questions in paragraph form in this section of your lab report.

There were no questions asked

If your lab results lead to wrong conclusions you should say so. Tell what your results are and then state what the results should have been. Include percent error if appropriate.

The percent error for my y-intercept and slope were both smaller than 5%. Because the error was so slight, there is no need to comment on it.